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# Evidence-Based Strategies and Practices to Manage Veterans' Noncancer Pain: A Systematic Review

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# Walden University

College of Health Sciences

This is to certify that the doctoral study by

Janice Ivery

has been found to be complete and satisfactory in all respects,  
and that any and all revisions required by  
the review committee have been made.

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Walden University

2018

Abstract

Evidence-Based Strategies and Practices to Manage Veterans' Noncancer Pain:

A Systematic Review

by

Janice D. Ivery

MSN, University of Phoenix, 2010

BSN, Youngstown State University, 1992

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

February 2018

## Abstract

Opioid therapy is widely used to treat veterans with chronic noncancer pain (CNCP) despite evidence indicating patient safety concerns with the treatment. Although there is a place for opioid therapy in chronic pain management, opioids are not recommended as the first line of treatment for CNCP because of the risk for accidental overdose and death. The purpose of this project was to examine alternative practices for managing CNCP through a systematic review of the literature guided by the conceptual model of the Joanna Briggs Institute method for systematic reviews (JBIM-SR). A critical appraisal of the literature was conducted, and data were extracted and analyzed to identify evidence-based alternatives to opioids for managing CNCP in veterans. Using Cochrane, CINAHL, Joanna Briggs, and PubMed databases for the search, 116 articles were initially identified and through exclusion of duplicates and those not consistent with the study purpose, the review was narrowed to 16 articles. A 2<sup>nd</sup> reviewer completed an identical search using the exclusion criteria and databases confirming the search results of the primary reviewer. The 16 peer-reviewed research studies published between 2006 and 2016 selected for the analysis were graded using the JBIM-SR grading chart. Educational programs were seen as positive for improving providers' use of alternative therapies for CNCP. Complementary and alternative therapies such as yoga, peer support, injection therapy, cognitive behavioral therapy and acceptance commitment therapy provided improvement in pain perceptions, and coping abilities. Results of this project can promote positive social change as the findings are shared with providers in the practice site and as Veterans receive safe alternatives to opioid therapy.

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## Dedication

This project is dedicated to the veterans who deserve the best evidence-based care second to none according to the mission statement of the Veterans Administration. The veterans gave of their time and lives to defend their country against enemies foreign and domestic and now entrust their lives and care in the hands of health care professionals who should be honored to care for them.

## Acknowledgments

First, I would like to thank my children, Marissa, Milani, and Matthew, and my mother Cora Ivery for their support, understanding and sacrifice during this major accomplishment in my educational journey. Then, I would like to thank my professors of Walden University for providing the foundation and knowledge needed to complete this project. Finally, I also would like to thank my mentor and preceptor Dr. Michael Saenger who shared his expertise while guiding and encouraging me to collaborate with other disciplines to identify the need for evidence-based interventions to provide quality care for veterans, society locally, nationally, and globally.

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## Section 1: Nature of the Project

### **Introduction**

One of the most common reasons people seek health services is for pain (Fishman, 2007). Pain is an enormous global public health concern (Goldberg & McGee, 2011). Globally, one in five adults suffer from pain while at least 1 in 10 adults are diagnosed with chronic pain (International Association for the Study of Pain [IASP], 2013). Chronic pain is reported to be the leading cause of disability (Breivik, Collett, Ventafridda, Cohen, & Gallacher, 2006). According to the Universal Declaration of Human Rights (United Nations, 1948), pain management is an essential human right as one of the universal prerequisites for health (Brennan, Carr, & Cousins, 2007).

Pain can be described as either acute or chronic. While acute pain is usually related to a time limited manageable event, chronic pain is longer lasting and more difficult to manage. Chronic pain is defined as a multidimensional health condition (IASP, 2013) persisting beyond the normal tissue healing time (Bonica, 1953), estimated to be between three to six months (Merskey & Bogduk, 1994). Chronic pain is usually classified as cancer related or non-cancer related pain. This project is focused on the non-cancer related type of pain.

While there is high quality evidence to provide a weak recommendation for short-term opioid management of chronic non-cancer pain (CNCP) (Trescot et al., 2008), there is little evidence to support long-term opioid management (Højsted & Sjøgren, 2007; Noble et al. 2010). According to Noble et al. (2010) patients often choose to discontinue long-term opioid management due to adverse events or insufficient pain relief; however,

for the remaining patients there is only weak evidence to suggest patients experience any clinically significant pain relief. Overall, improvements in patient outcomes, such as resolution of pain and quality of life, have not been found in epidemiological studies specific to long term opioid management (Ballantyne & Shin, 2008; Eriksen, Sjøgren, Bruera, Ekholm, & Rasmussen, 2006; Højsted & Sjøgren, 2007) while side-effects and adverse events are commonly reported (Cheatle, 2015).

Although CNCP is usually managed with long-term opioids (Miech et al., 2013), the therapy is less effective over time (Dowell, Haegerich, & Chou, 2016) and may be accompanied by accidental overdoses and deaths (Kissin, 2013). Despite the lack of evidence for long-term efficacy and ample evidence about dangers associated with long-term opioid management for CNCP, from 2010 to 2015 a 493% increase in opioid use disorder was seen (Zolot, 2017). In addition, more than 40% of opioid prescriptions continue to be written by primary care providers (Okie, 2010) when a referral to a pain management specialist is recommended (American Pain Society, 2009).

CNCP and opioid therapy is also problematic for veterans of the United States military. About 23% of all veterans have received opioid medications for pain. A diagnosis of posttraumatic stress, major depressive, and tobacco use disorders were strongly associated with chronic opioid use (Hudson et al., 2017). Prescription opioid use by veterans is a problem as the practice is widespread while not recommended. For example, in a retrospective cohort study of 291,205 veterans, during a year of follow-up, almost half of these veterans received at least 1 pain-related diagnosis and 12% were prescribed opioids within a year (Seal et al., 2012). In addition, mental health disorders

are predictive of opioid dependence accounting for more of the risk for abuse than non-opioid substance abuse (Edlund, Steffick, Hudson, Harris, & Sullivan, 2007).

There is a national public health crisis specific to inappropriate pain management for people living with CNCP. This crisis extends from excessive opioid use in the general population to veterans. The purpose of this doctoral project is to review the research literature specific to veterans and pain management to identify the best evidence for strategies to clinically manage CNCP.

### **Problem Statement**

This project was focused on identifying the evidence-based practices that increase the likelihood of improving patient outcomes (Stevens, 2013) for veterans living with CNCP and managed in the ambulatory setting. The clinical practice question guiding this project was focused on veterans diagnosed with CNCP and managed with opioid therapy in the ambulatory setting. The method was a systematic review to identify alternative therapies with equal or more effective outcomes and a safer risk profile than opioids.

### **Local Context for Gap in Practice**

Within an ambulatory care setting, CNCP management currently includes opioids as the standard of care. However, there is little evidence defining the efficacy and safety of opioid use for CNCP. The effectiveness of opioid therapy diminishes over time and may cause adverse effects (Noble et al., 2010), and substance use disorder (SUD) commonly accompanied by continued use of therapy (Lovejoy, 2016). However, there are alternative management strategies to opioid therapy that include acupuncture, physical therapy, aqua-therapy, and cognitive behavioral therapy (Denneson, Corson, &

Dobscha, 2011). These need to be explored as possible substitutions.

### **Local Relevance and Practice Environment**

Despite the contemporary pain management recommendations for people living with CNCP (Dowell et al., 2016). Veterans managed within the local ambulatory care system continue to be prescribed opioids. Staff and veterans must be provided with the current evidence-based information specific to the opioid therapy efficacy as well as the risk profile. Furthermore, alternative evidence-based strategies need to be offered to the veterans.

### **Significance and Implication for Nursing Practice**

Clinical practice which effectively measure and manage pain is a traditional nursing concern (Barnard, 1967; Healy, 1980). However, an understanding of the current research evidence specific to a well-defined pain protocol for a specific population is essential to improve the clinical practices that positively impact health outcomes. In this project, the research evidence about the clinical strategies to effectively manage Veterans living with CNCP were searched and synthesized. Nursing practices within the health system are improved by implementing the knowledge, derived from the evidence, into daily practice. By implementing contemporary clinical practices for Veterans living with CNCP, nurses can insure the appropriate use of opioid therapy to increase the efficacy of treatment while preventing adverse outcomes (Noble et al., 2010).

### **Purpose Statement**

This project was developed to identify the best available research evidence to inform clinical pain management practices for Veterans living CNCP. For this purpose,

the systematic review was the method selected to identify, assess, synthesize, and report the research evidence. With the research evidence synthesized by this project, recommendations for changes in the current practices are reported.

### **Gap in Practice Defined**

A gap in practice is defined as the observation or outcome of a practice that is different from another possible outcome based on professional knowledge (Accreditation Council for Continuing Medical Education, 2017). Gaps in clinical practice can be identified by observing current clinical practices, stating a problem with the observed practice, and developing a clinical practice question specific to the problem to guide an investigation for solutions. This project identified a gap in clinical practice, the initiation of long-term opioid management for Veterans living with CNCP and developed a clinical practice question to guide a systematic review.

### **Evidence-Based Practice**

Evidence-based health care is practice based on scientific merit to increase the likelihood of improved outcomes using specific processes to provide quality care (Stevens, 2013). Evidence-based practice is essential to implement reliable processes to achieve predictable outcomes. Clinical practice standardized by evidence maximizes the ability of health systems to produce high quality outcomes (Stevens, 2013). Within the evidence-based paradigm, the population, intervention, comparison, outcome, and timeframe, or PICOT question, guides the process to identify (a) gaps in clinical practice, (b) an applied research question to search the evidence, and (c) the best evidence to improve practice (Trice & Bloom, 2016).



**PICOT Process**

For this project, the PICOT process was used to develop the clinical practice question guiding the systematic review process. According to Echevarria & Walker, (2014) the clinical practice question identifies the population and the problem of interest, desired intervention or change, comparing the current practice with alternative practices to develop strategies for quality improvement. The clinical practice question identifies the population and the problem of interest, the desired intervention or change, and compares this to the current practice to identify strategies for improvement (Echevarria & Walker, 2014).

**PICOT Question**

The PICOT question guiding this systematic review was: For veterans diagnosed with CNCP and managed with opioid therapy in the ambulatory setting, what alternative therapies are available with equal or more effective outcomes and a safer risk profile.

Population/Problem/Place: Veterans diagnosed with CNCP and managed with opioid therapy in the ambulatory setting.

Intervention/ Intended Change: Evidence-based strategies to manage CNCP, including pharmacologic and non-pharmacological.

Comparison/Current standard: Current opioid management.

Outcomes desired: Alternative practices to improve pain management outcomes with a safer therapeutic profile.

Type/Time: Systematic review; January 1, 2006 to December 31, 2016.

## **Response to Gap in Practice**

This systematic review is an important response to develop solutions to address the gap in practice for managing CNCP within the health system. High levels of evidence such as systematic reviews and meta-analyses, randomized controlled trials, and large cohort studies of current pain management practices using opioids for CNCP compared with non-opioid interventions provide evidence-based best practice standards providing guidance for adopting safer pain care. The goal was to review, synthesize, and report the evidence and provide recommendations.

## **Nature of the Doctoral Project**

The nature of this project was to identify the current CNCP management practices and then review the research literature to recommend changes for to the current opioid prescribing practices and pain management protocols and policies in the ambulatory setting within the health system. This is important as overdoses (Kissin, 2013) contribute to more than 90% of deaths related to poisoning (Okie, 2010). Since 2010 there has been a 493% increase in opioid use disorders (Zolot, 2017). Through a systematic review, high quality evidence was reviewed, analyzed, and synthesized to propose recommendations for changes in clinical practices.

## **Projects Sources of Evidence**

For this systematic review, multiple databases were searched, including Cochrane, CINAHL, Joanna Briggs, and PubMed. The PICOT question guided the selection of key words and phrases for the search. Key terms used for the search were *chronic pain*, *non-cancer*, *opioids*, and *veterans*, combined with conjunction words and Boolean search

phrases. Research studies and protocol driven review papers published in English between January 1, 2006 to December 31, 2016 were included in this review.

### **Project Method**

This systematic review project followed the Joanna Briggs Institute Method for Systematic Reviews (JBIM-SR) to guide the steps for the literature search, data extraction, and data evaluation based on the research question (Pearson, Wiechula, Court, & Lockwood, 2005). The JBIM-SR offers a systematic process for gathering studies with supportive evidence to validate a change in clinical practice while protecting from the bias and errors commonly discovered during literature reviews. According to Jordan, Lockwood, Aromataris, and Munn (2016) the evidence for a systematic review should be feasible, meaningful, useful, and effective in improving quality outcomes. Through this systematic review process, this project resulted in the translation of evidence into recommendations for implementation into clinical practice, a process called translation science (Pearson, Jordan, & Munn, 2012).

### **Project Pathway**

The project pathway was developed to identify the best practices for managing the pain experienced by veterans living with CNCP, focused on comparing the efficacy of the non-opioid and opioid management strategies. According to the VA, (2014) opioid use has been the mainstay for chronic pain management within the, and adoption of non-opioid practices for CNCP should be considered to provide safer pain care.

## **Significance**

The project is significant in terms of the management of CNCP. The systematic review process resulted in the identification of the best evidence to recommend the safest and most effective pain management practices for veterans living with CNCP. Providing clinicians with access to the best evidence to more effectively to manage this population can result in dramatic improvements in the overall quality of life for veterans. The development of recommendations specific to the best practices for pain management can result in the appropriate use of opioid therapy, and alternatives, to prevent overdose, misuse, and illicit drug use, as well as improve the efficacy (Moore, 2014). Opioid use and overdose related deaths are at epidemic proportions (Kissin, 2013), requiring changes in current management practices (Dowell et al., 2016).

## **Stakeholders**

The stakeholders for this project are the veterans and their families and the clinicians the leaders at the health system. Veterans can benefit from receiving safer pain management, including prevention of accidental overdose. Clinicians will benefit from fewer wrongful death litigations and, less scrutiny by drug enforcement agencies.

## **Contributions to Nursing Practice**

This systematic review of the research literature specific to the management of the pain experienced by veterans living with CNCP guided the process to translate the evidence into recommendations for new clinical practices. The evidence needs to be translated into a format accessible to clinicians responsible for pain management. The recommendations then have the potential to shift clinical management practices to

improve pain relief as well as preventing adverse outcomes such as accidental overdoses (Kissin, 2013). If the recommendations for changes in clinical practice are adopted, nurses will need to gain new knowledge and develop new care plans, including patient education, to facilitate a rather challenging transition from old to new practices.

### **Transferability of Knowledge**

The transferability of knowledge from a JBIM type systematic review is highly likely due to the focus on translation science into clinical practices. The information resulting from this systematic review can be used throughout the health system. In addition, other health care organizations where opioids are heavily used for the management of CNCP might also benefit from the recommendations from this project.

### **Implications for Positive Social Change**

One hundred million Americans are treated for chronic pain, costing approximately 560 billion annually, causing public concern in the United States (Institute of Medicine, 2011). Providing evidence-based literature to support improving chronic pain care will decrease rising costs of pain management, reduce adverse events from opioid use, and improve veterans' quality of life.

### **Summary**

The use of evidence-based best practices in CNCP care ensures safe chronic pain management. One in five people suffer with chronic pain, and opioid therapy is often used for pain control. Opioid use has increased over the past 10 years causing an increasing trend in overdoses and opioid-related deaths (Eccleston, 2017). It is imperative that evidence-based best practice is considered when treating CNCP. Data

from this literature review provide supportive information needed to adopt best practice standards for treating CNCP. Section 2 consists of an extensive literature review identifying evidence-based best practices for providing veterans with chronic pain management and the need to implement an ongoing educational initiative to provide health professionals with information about best practices in chronic pain management. Appropriate evidence-based prescriber pain management education is supported by Health and Human Services organization and the President of the United States. The President of the United States proposed a budget of 80 million dollars to decrease the number of accidental overdoses and opioid related deaths (Dowell et al., 2016).

## Section 2: Background and Context

### **Introduction**

Veterans living with CNCP managed in the ambulatory setting within a large government health system are prescribed opioids for CNCP (Lovejoy et al., 2016) although the Centers for Disease Control and Prevention recommends non-opioid therapies (Dowell et al., 2016). The aim for this systematic literature review was to identify the evidence-based best practices that offer a safer and more effective strategy to relieve the CNCP pain experienced by veterans. Appraisal of high quality research is essential to identify the best evidence, or clinical strategies, to manage CNCP. In this section, the theories, models, and concepts used to guide this project are described and discussed. An overview of defined terms as well as a summary of the general literature specific to the systematic review is also presented in this section.

### **Theories, Models, and Concepts**

#### **JBIM-SR**

The JBIM-SR (Pearson et al., 2005) method for systematic reviews guided this project. The processes included applying the PICOT question as a search strategy. The question guided the identification of the relevant research data for extraction, and appraisal. When completed, the outcomes of this project resulted in recommendations, based on good quality evidence, that are feasible, meaningful, useful, and effective for improving clinical practices (Jordan et al, 2016). The JBIM-SR identifies steps to minimize bias and errors during systematic literature reviews providing scientific evidence-based literature to support development of quality care. Evidence-based practice

is essential to implement reliable processes to achieve safer predictable outcomes, standardize care and provide clinicians with reliable strategies to care for patients (Stevens, 2013).

### **Terms**

The following terms used for this project are defined below.

*Chronic pain*: Pain persisting for more than 2-3 months (Mason, Cates, & Smith, 2015).

*JBI Systematic review*: A process of reviewing literature to identify current practices with previous practices to identify which yields evidence-based best outcomes (Bennett & Porche, 2017)

*Opioid synthetic*: A medication possessing characteristics of opiate narcotic but not a derivative of opium (Lobmaier, Kornor, Kunoe, & Bjørndal, 2008).

*Opioid*: A medication which acts on the opioid receptor of the brain and spinal cord decreasing the perception of pain (National Institutes of Health, 2017).

*Systematic review*: A rigorous, exhaustive review of evidence-based literature on a specific topic of interest (Higgins & Green, 2011).

*Veteran*: Someone who has fought in a war or served in the armed forces (VHA, 2014).

## **Project Relevance to Nursing Practice**

### **Search Strategy**

Using the JBIM-SR method, a search of the electronic data bases of literature was conducted. The databases included, Cochrane, CINAHL, Joanna Briggs Institute, and



PubMed. The inclusion criteria included English language peer-reviewed research published between January 2006 and December 2016. Literature was excluded if not meeting the inclusion criteria. The literature included random controlled trials (RCTs), quantitative and qualitative studies, and literature reviews. The key terms for the search included *chronic pain*, *non-cancer*, *opioids*, and *veterans*, combined with conjunction words and Boolean search phrases. A total of 116 papers were identified during this review. These papers included 37 retrieved from Cochrane, 17 from CINAHL, 9 from Joanna Briggs, and 53 from PubMed. From this work, there were 16 research papers included in the review (see Appendix C). A summary of the general and specific literature initially reviewed to “scope” the complete the larger systematic review is provided next section.

### **Overview of the Literature**

Lovejoy (2016) identified substance use disorder as commonly accompanying the use of prescription opioid therapy. Lovejoy completed a study using three groups of veterans with CNCP by requiring veterans to complete questionnaires to evaluate their psychosocial history in a structured interview and extracting their opioid pharmacy data from a VA electronic database to identify veterans who were prescribed opioids. Three categories of veterans were included in the study, long-term opioid therapy greater than 90 days ( $n = 49$ ), short-term opioid therapy less than 90 days ( $n = 31$ ), and no opioid therapy use ( $n = 134$ ). Of the three identified categories, veterans prescribed long-term opioid therapy were found to have more pain diagnoses, greater pain levels, and pain interference in functioning than those on short-term or no opioid therapy. The

implications for changes in chronic pain management using long-term opioid therapy for CNCP are supported by this study which identifies a strong correlation between opioid therapy and patients diagnosed with substance use disorder.

The VA reviewed 200 notes of veterans prescribed long-term opioid therapy to identify methods to improve treatment for chronic pain by assessing pain levels, treatment plans, re-assessments, and patient education using a Pain Care Quality extraction tool to plan step care (Moore et al., 2016). This tool improved pain care over time by allowing health care providers to readily obtain useful information for planning safer care. Patients prescribed long-term opioid therapy are at greater risk of overdose and accidental death (Kissin, 2013), while receiving very little pain relief and little improvement in physical functioning. With an increase in accidental overdose deaths, the veteran population is affected, as well as the public sector, increasing the urgency to provide alternative methods to opioid therapy for chronic pain management.

Complementary and alternative medicine (CAM) has been identified as a valid alternative to opioid therapy for providing safer chronic pain management. Denneson et al. (2011) completed RCTs that included five VA health care outpatient clinics to evaluate the effectiveness of CAM therapies in managing CNCP to evaluate the difference in pain relief properties of various CAM methods: massage therapy, manipulation therapy, herbal agents, and acupuncture (Denneson et al., 2011). The researchers recruited participants who had used CAM methods previously as well as participants who had not to compare their levels of satisfaction in treatments received. The two groups' levels of satisfaction of CAM methods showed few variations

(Denneson et al., 2011). Of the CAM therapies offered, 95% of veterans preferred massage therapy, while the least preferred CAM method was manipulation therapy (Denneson et al., 2011). Implications from this CAM study supported the idea of developing policy and practice change in the way that CNCP is treated.

Krein (2016) also completed a CAM study to determine the validity of using walking as a method of treatment for CNCP as part of a RCT with the purpose of reducing back pain. Krein recruited 229 veterans being treated for chronic back pain and prescribed opioids. Of those, 118 received the standard pain management protocol and 111 participated in a step-counting study. A step count was completed and uploaded from pedometers at the start of the study for a baseline and then again at 6 and 12 months. Surveys were used to identify veterans who continued to use opioid therapy during the walking study. Forty percent of the participants in the study reported use of opioids in managing their pain during the study. A comparison in the number of steps taken by veterans using opioids and the number of steps taken by veterans not using opioids showed an increase of 1,200 steps from the baseline for those on opioid therapy but no change in step count for veterans not using opioids and participating in the walking intervention. The data supports the importance of offering walking therapy as a CA a greater interest in participating in walking therapy to manage chronic back pain.

### **Evidence to Address the Gap in Practice**

Currently opioids are used to manage the pain of veterans living with CNCP although alternative practices are available, but often not considered. According to the CDC (Dowell et al., 2016), opioids should not be considered and can lead to misuse and

abuse. Pain management practices within the health system need to change with the development of new therapies as well as new evidence suggesting current therapies are equally or more effective.

### **Local Background and Context**

Nurses often take the leadership role in assessing and planning care in the practice area and gathering data to provide input in the best interest of the patients, assisting providers with appropriate prescribing. Opioid use is often used to treat CNCP for veterans and can be effective for short-term pain relief, but the best available evidence supports that the effectiveness of opioid use greater than 6 months varies with moderate pain relief, demonstrating the need for alternatives for treating CNCP (Grant, Colello, Reihl, & Dende, 2010).

### **Evidence to Justify the Problem**

Development of new opioid prescribing practices and policies are necessary because patients prescribed opioid therapy are at risk for accidental overdose and death. Ninety percent of deaths related to poisonings are caused by drug overdoses (Okie, 2010) and continue to rise. The appraisal of high quality evidence from research studies identified alternative evidence-based best practices for managing the pain experiences by veterans living with CNCP.

### **Institutional Context**

Large scale opioid use continues within the health system despite the CDC and VHA recommendations to decrease opioid use for CNCP. The result is many veterans are dependent, possibly addicted, to the opioids to manage their chronic pain. Also, they are

reluctant to discontinue the opioid use. Guidelines were developed and disseminated throughout the health system, and educational programs are needed to disseminate new information to patients and staff (VHA, 2014).

### **State and Federal Context**

The state of Georgia requires veterans prescribed opioids to obtain urine drug tests every ninety days. The clinicians must also check the Prescription Drug Monitoring Program (PDMP) website to assess for duplication of opioid prescriptions (VHA, 2014). These processes were implemented to limit the potential for prescription abuse, including multiple and duplicative prescribing practices.

### **Role of the DNP Student**

As a DNP student, I have completed a systematic literature review to identify the best practices for treating CNCP in veterans using the JBIM-SR. I then extrapolated data using the JBI data extraction tool listed in Appendix A and placed them in a table to allow easy assessment of the literature.

### **Professional Relationship to the Project**

My professional relationship to the project is for DNP fulfillment and to obtain information to support development protocols, evidence-based best practice, and development of educational programs for veterans and staff providing updated information about safer chronic pain management.

### **Professional Role in the Project**

My professional role in the project as a senior nurse is to develop pain management protocols and educational programs for veterans and staff to provide

evidence-based best practice and evidence to support positive change in chronic pain management practices.

### **Motivation for Completing the Project**

My motivation to pursue a project to address changes in chronic pain management is to ensure that evidence-based information is used to inform safer pain care and development of pain care protocols and educational programs for veterans and staff.

### **Potential Bias**

To avoid potential bias there were two independent reviewers who completed the literature search and reviewed the resulting evidence-based best practices for treating CNCP. Following a robust method such as the JBIM-SR, the systematic review provides the strongest evidence to support a change in clinical practice. Only the meta-analysis offers a higher level of evidence.

### **Role of the Project Team**

The project team consisted of the DNP project leader, a second reviewer, the committee chair, and the committee members. Upon approval of the DNP project proposal, the systematic review was presented to the Walden University Institutional Review Board (IRB) for approval. Once the approval was provided, the literature search was undertaken.

### **Team Member Expertise and Contextual Insight**

The DNP project leader has been a clinician in the health sector for more than 30 years, as a military medic, LPN, and RN with experience in primary care and emergency nursing. The second reviewer, the DNP prepared nurse practitioner, has worked with

adult primary care and long-term care for seven years. She currently works in the areas of family practice and mental health and has practiced as an NP over the past four years. The committee chair and members are professors at Walden University.

### **Team Member Responsibilities and Timeline**

The review was completed per the JBIM-SR process (Pearson et al., 2005); literature search, review and assessment, analysis, synthesis, and recommendations. A DNP prepared nurse practitioner served as the second reviewer to replicate the search using the same electronic databases, terms, and inclusion and exclusion criteria to prevent bias. In addition, the resulting literature was verified by the second reviewer. The committee chair and member also reviewed the work and recommended improvements prior to completion.

### **Summary**

Chronic pain management is complicated and requires evidence-based best practice standards to provide safe, effective pain care. Appraisal of high quality evidence-based studies was needed to identify evidence-based practices for managing CNCP in veterans, inform practice, and support the development of safer pain management protocols and policies. Systematic literature reviews of peer-reviewed RCTs provide rigorous evaluation of scientific outcomes for best practices for safely treating veterans with CNCP (Jordan et al., 2016).

## Section 3: Collection and Analysis of Evidence

### **Introduction**

For this project, a systematic literature review using JBIM-SR guideline (Pearson et al., 2005) was undertaken to identify best strategies for managing veterans with CNCP in the ambulatory setting. Specifically, the JBIM method for systematic reviews is clear and object which limits bias in searching for and appraising the research evidence (Jordan et al, 2016). The steps used for the JBIM-SR are provided in Appendix C. For this review, qualitative and quantitative research was searched specific to veterans, CNCP, and management strategies to determine the best options focused on comparing opioids and non-opioid therapies. The research was reviewed and appraised for the quality of evidence to determine the level of support for the evidence-based practices to manage pain for veterans living with CNCP.

### **Practice-Focused Question**

Opioid therapy is widely used to manage the pain of veterans living with CNCP despite recommendations to the contrary. Managing the CNCP experienced by veterans is complex and continually changing. The review was completed to identify the best alternative therapies to manage the CNCP. The practice-focused question was developed to assess the best evidence for clinical practice to guide the advancement of management guidelines to address the pain of veterans living CNCP.

### **Project Purpose and Method Alignment**

The purpose of this project was to identify the best evidence to guide the pain management practices for veterans living with CNCP. For this project, a systematic



review method was used to identify the best evidence for to appropriately manage the CNCP experienced by many veterans. The JBIM-SR method (Pearson et al., 2005) was used to guide steps for searching databases, extracting data, and evaluating data that supports the project question. JBIM-SR provides a systematic process for gathering supportive evidence-based outcomes to validate a change process while preventing bias and errors during systematic literature reviews. According to Jordan et al. (2016) evidence must be feasible, meaningful, useful and effective in improving quality outcomes.

### **Sources of Evidence**

The sources of evidence consisted of searches of the most prominent electronic databases for peer reviewed research literature, including the Cochrane, CINAHL, Joanna Briggs, and PubMed electronic databases. The search focused on identifying the strongest evidence including meta-analysis, systematic reviews, and randomized controlled trials to inform clinical practice (Stevens, 2013). Research papers published between January 1, 2006 and December 31, 2016 were retrieved from the data based using keywords, phrases, and terms detailed in later sections of this project.

### **Published Outcomes and Research**

Published outcomes and research articles within the systematic literature review provide supporting evidence to ensure that pain management practices are safe and up to date. Evidence-based health care is practice based on scientific merit to increase the likelihood of improved outcomes using specific processes to provide quality care and is essential to produce reliable, predictable quality outcomes (Stevens, 2013).

## Search Strategy

Research studies published between January 1, 2006 and December 31, 2016 were identified through a structured search with targeted key terms in multiple electronic databases, including Cochrane, CINAHL, Joanna Briggs, and PubMed using a systematic process and keywords. The key terms included *chronic pain, non-cancer, opioids, and veterans* combined with conjunction words and the Boolean search phrases. The inclusion criteria also limited the search to the English language literature. The papers from the literature review included peer reviewed quantitative and qualitative research studies. In the first process, title review, articles were excluded if the title lacked the information specific to the area of interest, lacked relevance to the project question, and/or referenced cancer type pain. After the research paper titles were reviewed, and inappropriate titles were excluded, the remaining abstracts were reviewed. The same process for the title review was completed with the abstracts to limit the full review of articles to exclude those not focused and specific to the population and problem of interest. Through this search, 116 papers were identified, including 37 papers retrieved from Cochrane, 17 from CINAHL, 9 from Joanna Briggs, and 53 from PubMed.

The second reviewer was duplicated the search strategy to prevent bias and ensure accuracy. Then, using the identified search strategy, the 116 citations, were narrowed due to 13 duplicates and 71 did not meet the inclusion criteria based on the title. The resulting 32 paper abstracts were reviewed to determine if the PICOT question was addressed by the research method. An additional 12 papers were excluded based on inclusion/exclusion criteria. Finally, the remaining twenty full articles were reviewed,

four excluded based on inclusion/exclusion criteria. A total of 16 research studies were included in the review.

### **Analysis and Synthesis**

From the final grouping of 16 research papers, the data was extrapolated with the Meta-Analysis of Statistics Assessment and Review Instrument (MAstARI) extraction tool (Appendix A) and entered into in an evidence matrix (Appendix D) to allow easy assessment to the reviewed literature. For this review, the data is largely presented in a narrative format due to the variations in study methods and measured outcomes.

### **Data Systems and Procedures**

The data for this review resulted from a search of multiple electronic databases, including Cochrane, CINAHL, Joanna Briggs, and PubMed. Research studies identifying pain management outcomes for CNCP from meta-analyses, systematic reviews, and RCTs were most important for inclusion this review. The data was then translated into evidence through the appraisal and synthesis previously described. Then, this information was transferred into recommendations for implementation into practice.

### **Data Integrity**

The monitoring of data integrity was not necessary due to the use of public secondary databases to access the research papers. Despite the lack of human subjects, this systematic review protocol was reviewed and approved by the Walden University Institutional Review Board prior to initiating the search strategy. The protocol number is 06-07-17-0374713.

## **Data Analysis**

The quality of evidence was graded using JBI-SR grading chart (Appendix B). Grade A represents a strong recommendation with high-quality evidence likely to yield high-quality outcomes. Grade B indicates low recommendation providing evidence likely to support low-quality outcomes. The data analysis process was completed based with the FAME (Feasibility, Appropriateness, Meaningfulness and Effectiveness) process (JBI, 2016, 2014). Through the analysis of the data, the feasibility, appropriateness, meaningfulness, and effectiveness of data in providing useful, safe, evidence-based information that is transferable and supports a change in practice. The findings are presented in narrative form content.

## **Summary**

A systematic review of the evidence-based peer reviewed literature provided the data, when analyzed and synthesized that informed the current clinical practices for pain management in the health system. For this project, the JBIM-SR was utilized to seek the evidence to guide the development of new pain management policies and protocols. The methods focused on identifying the best evidence-based practices to advance the effectiveness of CNCP management for veterans. This systematic review provides a rigorous evaluation of the contemporary literature with recommendations for changes in clinical practice.

## Section 4: Findings and Recommendations

### **Introduction**

Chronic pain is a major concern in the veterans' health care arena. Forty percent of opioid prescriptions are written to treat CNCP by primary care providers although opioid use poses potential health risks (Okie, 2010). Patients prescribed opioid therapy are at risk for accidental death and overdose (Kissin, 2013), requiring a need for new opioid prescribing practices and policies. Ninety percent of deaths related to poisoning are caused by drug overdoses (Okie, 2010), and to date have increased greater than 400% (Zolot, 2017). Appraisal of high-quality evidence-based studies identifies evidence-based best practices for managing CNCP in veterans. In this section, the 16 studies that met the inclusion criteria for this systematic review (Appendix C) were analyzed and synthesized. The findings are presented in this section.

### **Findings and Implications**

This analysis and synthesis for this systematic review was completed with the 16 research papers that met the inclusion criteria. The quality of evidence was graded using JBI-SR grading chart (Appendix B). The Grade A assessment represents a strong recommendation with high-quality evidence likely to yield high-quality outcomes. The Grade B assessment indicates a low recommendation providing evidence likely to support low-quality outcomes. For this review, evidence-based management strategies for CNCP included yoga, botulinum toxin injections, chondroitin injections, peer support, and behavioral therapies. Overall, most of the evidence indicates opioids pose multiple health

risks and little evidence supports the efficacy and safety profile for opioid management strategies for CNCP (Appendix D).

### **Education and Knowledge about Therapies**

Four studies addressed the effects that knowledge and education had on beliefs and behaviors about chronic pain management and preferred treatment options. Three of the studies provided evidence of adequate quality to provide a positive outcome (Grade A), and one provided evidence of lesser quality to provide a positive outcome (Grade B). Frank et al. (2015) reviewed treatment modalities used by providers ( $n = 159$ ) who attended or presented during Specialty Care Access Network-Extension for Community Healthcare Outcome (SCAN-ECHO) sessions for treating patients ( $n = 22,545$ ) with chronic pain. Providers attending or presenting for SCAN-ECHO sessions were less likely to prescribe opioids for CNCP and frequently chose physical medicine services instead of pain medications. Unanticipated limitations consisted of multiple articles identifying opioids as not preferred for CNCP and few evidence-based studies identifying alternative pain management options to opioids.

Cosio and Lin (2015) completed a quasi-experimental study (Grade B) using a pre- and posttest to identify if veterans ( $n = 103$ ) receiving 12 weeks of pain education are likely to choose complementary alternative medicine (CAM) and therapies over opioid therapy. The findings indicated a significant difference in the use of CAM therapies for veterans receiving pain education about CAM therapies. Chapman et al. (2010) completed a secondary analysis evaluating guidelines for chronic pain management developed by interdisciplinary research experts to assess veterans prescribed

opioids for 6 months or longer to determine the benefits and the harm of opioid use in chronic pain management. The experts indicated that scientific evidence lagged behind the growing use of opioids and the need for a strong evidence base to guide chronic pain management limiting opioid use because the risks of opioid use outweigh the benefits. Chapman et al. (2010) identified significant difference between the beliefs and behaviors of patients and providers who did not receive opioid and CAM therapy education and those who did receive education.

Denneson et al. (2011) completed a secondary analysis of systematic reviews to evaluate the use of CAM therapies among veterans with previous CAM use ( $n = 401$ ) compared with veterans having no previous CAM use. The results revealed that veterans with previous CAM use are likely to use CAM therapies because of previous positive effects. Providing education about CNCP, opioid therapy, alternatives to opioids, and prior pain care knowledge influences beliefs and behaviors concerning CNCP management. Two studies identified CAM as therapies of choice for patients and providers after they gained knowledge about the efficacy of these therapies. Providers were less likely to choose opioids as the first line of treatment after attending or presenting educational pain presentations during SCAN-ECHO sessions. Providing knowledge about alternative pain management options allows patients and providers to choose pain management options with fewer adverse events.

### **Opioid Therapies**

In five of the studies, researchers evaluated the effects opioid use has on pain relief and behaviors of those treated for CNCP over time. Four of these studies provided

lower quality evidence supporting positive outcomes (Grade B), and one provided high quality evidence supporting positive outcomes (Grade A). Naliboff et al. (2011), used a RCT of 135 veterans for 12 months (94% males and 74% with musculoskeletal pain) and compared patient responses to escalating opioid dosages with hold-the-line opioid dosing for chronic pain management and found a significant risk of opioid misuse with no statistically significant difference in primary outcomes. Patients receiving increased opioid dosages experienced slightly improved pain control compared with veterans receiving non-escalating doses of opioids. Morasco, Cavanagh, Gritzner, & Dobscha, (2013) completed a retrospective cohort study for veterans with CNCP ( $n = 60$ ) comparing the effectiveness of a daily dose of 179 mg of morphine equivalent with a daily dose greater than 180 mg of morphine equivalent, and there were no significant differences in the variables assessed.

Sekhon, Aminjavahery, Davis, Roswarski, & Robinette (2013) completed a retrospective chart review of veterans ( $n = 800$ ) with CNCP receiving opioid therapy greater than three months or more. According to the records they reviewed, 22.9% of the veterans elicited aberrant behaviors. Simmonds, Finley, Vale, Pugh, & Turner, (2015) conducted a focus group to identify barriers and facilitators to using CAMs for veterans ( $n = 25$ ) receiving a 50 mg. morphine equivalent daily dose for six months or greater. The findings indicated that veterans who were prescribed long-term opioid therapy formed pervasive attitudes preventing them from considering CAM therapies rather than opioid therapy.



Morasco, Duckart, & Dobscha (2011) completed a cohort study of veterans ( $n = 5,814$ ) over 12 months comparing veterans with SUD and veterans without SUD to evaluate adherence to clinical guidelines for long-term opioid therapy use. Only 35% of veterans with SUD received substance abuse treatment and it was found that veterans with SUD require more intense treatment to gain improved pain control and are likely to experience adverse events and poor outcomes. Aberrant behaviors, SUD, development of pervasive attitudes towards using adjunct or alternative therapies, and inability to adhere to opioid clinical guidelines were areas associated with those receiving opioid therapy. The lack of evidence of opioid therapy providing pain control or improved quality of life indicates that the use of opioids is not a feasible pain management option.

### **Mental Health Therapies**

In five studies researchers addressed the effects mental health therapies have on perceptions about pain intensity, efficacy of pain control, and ability to improve physical functioning. All five studies were grade-A levels of recommendation with high levels of quality evidence. Brinzo, Crenshaw, Thomas, & Sapp (2016) completed a retrospective cohort review of males and females 18 years or older with chronic back pain lasting for at least 12 weeks, and participated in yoga for approximately 4 weeks. It was determined that the effects of yoga on pain has positive effects on pain perception, improved back function, and increased veterans' sense of wellbeing. Matthias et al. (2015) completed a secondary analysis of RCTs of 20 patients with chronic pain assisted by 10 coaches to evaluate the effectiveness of peer support on chronic pain management, and determined that peer support can be effective in pain management supporting self-efficacy showing

improvements in pain control. Whitten & Stanik-Hutt (2013) completed a qualitative study using CBT with 22 patients with chronic pain to identify the perceptions of pain control outcomes after completing a CBT program over 6 weeks. The findings revealed that selected outcomes were improved for patients treated with opioids for CNCP. Cosio et al. (2015) with a level-B recommendation completed a study using a paired sample t-test, pre- and posttest for veterans ( $n = 50$ ) receiving acceptance and commitment therapy (ACT) for CNCP to determine the effectiveness of ACT in pain relief. ACT was identified as an effective treatment for CNCP for veterans and should be considered as a secondary consultative service for CNCP. Cosio (2016) conducted a quasi-experimental study using ACT or CBT using a pre- and post-test for veterans ( $n = 96$ ) comparing the effectiveness of CBT with ACT for pain relief and decreasing the focus on pain and improving coping skills. Outcomes for mental health pain interventions such as peer support, CBT and ACT were consistent in improving pain perceptions, coping abilities, and improved quality of life. Two of the studies suggested that ACT and CBT be used as adjunct therapies to opioids, suggesting that opioids can be safely used when combined with mental health therapies

### **Injection Therapies**

In two studies researchers identified injection therapies using chondroitin and botulinum for CNCP yielded high levels of evidence with grade-A levels of recommendations. Singh, Noorbaloochi, MacDonald, & Maxwell (2015) completed a secondary analysis of 43 RCTs including 4962 participants receiving chondroitin and 4148 receiving placebos to compare the effects of pain relief using chondroitin compared

with a placebo over a one to three months duration. The findings identified that chondroitin use was beneficial yielding an eight-point improvement in pain control which is clinically significant. Singh and Fitzgerald (2010) completed a secondary review of six RCTs of 164 participants with chronic pain to compare the efficacy and safety of botulinum toxin injections compared with a placebo in treating chronic shoulder pain after 3 to 6 months post injection evaluation. The outcome identified that botulinum toxin injections reduced pain severity with a 95% CI using the 10-point scale and reduction in shoulder disability. Both agents were effective significantly in relieving pain, 8-point improvement on a 10-point scale for chondroitin and a 95% confidence interval on a 10-point scale for botulinum with the duration of 3 to 6 months. Use of injections poses less risk of adverse events and are cost-effective, yielding this method feasible for treating CNCP.

Data from this review will support development of safer pain management policies, protocols and inform safer practice for CNCP. Lack of studies for pain management alternatives to opioids and medications will support the need for future research to identify additional CAM therapies and physical medicine treatments for CNCP. Providing evidence-based information supports the need for legislative mandates to protect communities from overuse of opioids and unsafe prescribing practices. Improved safer pain care will positively impact the lives of those suffering with chronic pain and their loved ones.

### **Recommendations**

Based on limited evidence to support physical medicine therapies and mental health therapies as effective treatments, it is recommended that further research including RCTs of physical and mental health treatments for CNCP in veterans be completed. This review will provide evidence to gain legislative support to obtain funding to support research and policy development for safer pain care, and increase public safety.

### **Contributions of the Doctoral Project Team**

The project team consisted of the DNP student, a second reviewer, Project Chair and DNP committee. The Chair approved the proposal which was presented to Walden's IRB and DNP committee for approval. A second reviewer replicated the literature search using identified inclusion and exclusion criteria to prevent bias, and if reviewers were not in agreement with articles for the review, consensus was reached to include or exclude an article. A literature review matrix was developed to organize data, and data were extracted, and graded using JBIM-SR tools.

### **Declaration of Conflict of Interest**

There were no conflicts of interest by the authors for this project. The purpose of this project was to fulfill the requirement of the Doctor of Nursing Practice degree of Walden University, and identify evidence-based best practice for developing protocols for treating CNCP. No funding or monetary compensation were provided to complete this project.

### **Implications**

Implications for this review supports development of protocols, policy, and procedures for treating CNCP in veterans to provide safer pain management. One hundred million Americans are treated for chronic pain, costing approximately 560 billion annually causing public concern in the United States (Institute of Medicine, 2011). Providing evidence-based chronic pain care will improve patient outcomes, decrease rising costs of pain management, reduce adverse events from opioid use, and improve veterans' quality of life.

### **Strengths and Limitations of the Project**

The strength of this project consists of literature from systematic reviews and multiple RCTs consisting of highest evidence-based human research to support development of policies, procedures and protocols of health care. Limitations of the project consist of few articles identifying greater numbers of various forms of CAM methods.

### **Summary and Conclusions**

In conclusion, the evidence suggests that evidence-based best practice for CNCP management consists of non-opioid therapies. Lack of sufficient evidence supporting the use of opioids validates the need to develop protocols and strategies to provide safer chronic pain care. Systematic reviews of RCTs provide the highest level of evidence and are likely to support development of reliable quality improvements in chronic pain care (Higgins & Green, 2011). CAM use for best pain care consists of physical medicine and mental health combined to maximize safe evidence-based CNCP care. Best practices

based on this review are identified as acupuncture, injection therapy, peer support and cognitive behavioral therapies. Sufficient evidence supporting opioid use for CNCP is not available, requiring additional research to identify best practices to support the development of pain protocols and safer pain care.

## Section 5: Dissemination Plan

### **Introduction**

The plan for dissemination includes submission of the project to Walden University's website for others to view. I also plan to provide the project to the VA education department to assist with developing staff educational programs to educate staff about safe pain management practices and the evidence-based best practice for CNCP in veterans.

### **Analysis of Self**

My professional role in this project is one of a senior nurse with the ability to develop educational programs for veterans and staff providing the best evidence to support a change in practice, and develop protocols, policies and procedures for safer pain management. I also view myself as a scholar and pain management resource person for staff members and veterans. Challenges encountered during this program involved slow processes with IRB approval and multiple edits during the proposal development process. I plan to collaborate with leadership and legislators to garner support for funding and development of safer pain care practice and educational programs.

### **Summary**

This project will serve as a high quality systematic review which can be used to develop pain management strategies and protocols to ensure safe pain care using best evidence-based research. This systematic review will provide evidence-based outcomes supporting evidence-based best practices for pain management allowing readers to make an informed decision when planning care for patients with chronic pain. The process has

been one of a challenge and lasted longer than expected. Timely feedback is a necessity and templates identifying what is expected were most helpful.



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## Appendix A: MAsARI Data Extraction Tool

**JBI Data Extraction Form for  
Experimental / Observational Studies**

Reviewer ..... Date .....

Author ..... Year .....

Journal ..... Record Number .....

**Study Method**RCT  Quasi-RCT  Longitudinal Retrospective  Observational  Other **Participants**Setting  
\_\_\_\_\_Population  
\_\_\_\_\_**Sample size**

Group A \_\_\_\_\_ Group B \_\_\_\_\_

**Interventions**Intervention A  
\_\_\_\_\_  
\_\_\_\_\_Intervention B  
\_\_\_\_\_  
\_\_\_\_\_Authors Conclusions:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_Reviewers Conclusions:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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## Appendix B: JBIM Grading Chart



THE JOANNA BRIGGS  
INSTITUTE



THE UNIVERSITY  
of ADELAIDE

School of Translational Health Science

## New JBI Grades of Recommendation

*Developed by the Joanna Briggs Institute Levels of Evidence and Grades of Recommendation Working Party October 2013*

JBI Grades of Recommendation	
Grade A	A 'strong' recommendation for a certain health management strategy where (1) it is clear that desirable effects outweigh undesirable effects of the strategy; (2) where there is evidence of adequate quality supporting its use; (3) there is a benefit or no impact on resource use, and (4) values, preferences and the patient experience have been taken into account.
Grade B	A 'weak' recommendation for a certain health management strategy where (1) desirable effects appear to outweigh undesirable effects of the strategy, although this is not as clear; (2) where there is evidence supporting its use, although this may not be of high quality; (3) there is a benefit, no impact or minimal impact on resource use, and (4) values, preferences and the patient experience may or may not have been taken into account.

The FAME (Feasibility, Appropriateness, Meaningfulness and Effectiveness) scale may help inform the wording and strength of a recommendation.

**F – Feasibility; specifically:**

- What is the cost effectiveness of the practice?
- Is the resource/practice available?
- Is there sufficient experience/levels of competency available?

**A – Appropriateness; specifically:**

- Is it culturally acceptable?
- Is it transferable/applicable to the majority of the population?
- Is it easily adaptable to a variety of circumstances?

**M – Meaningfulness; specifically:**

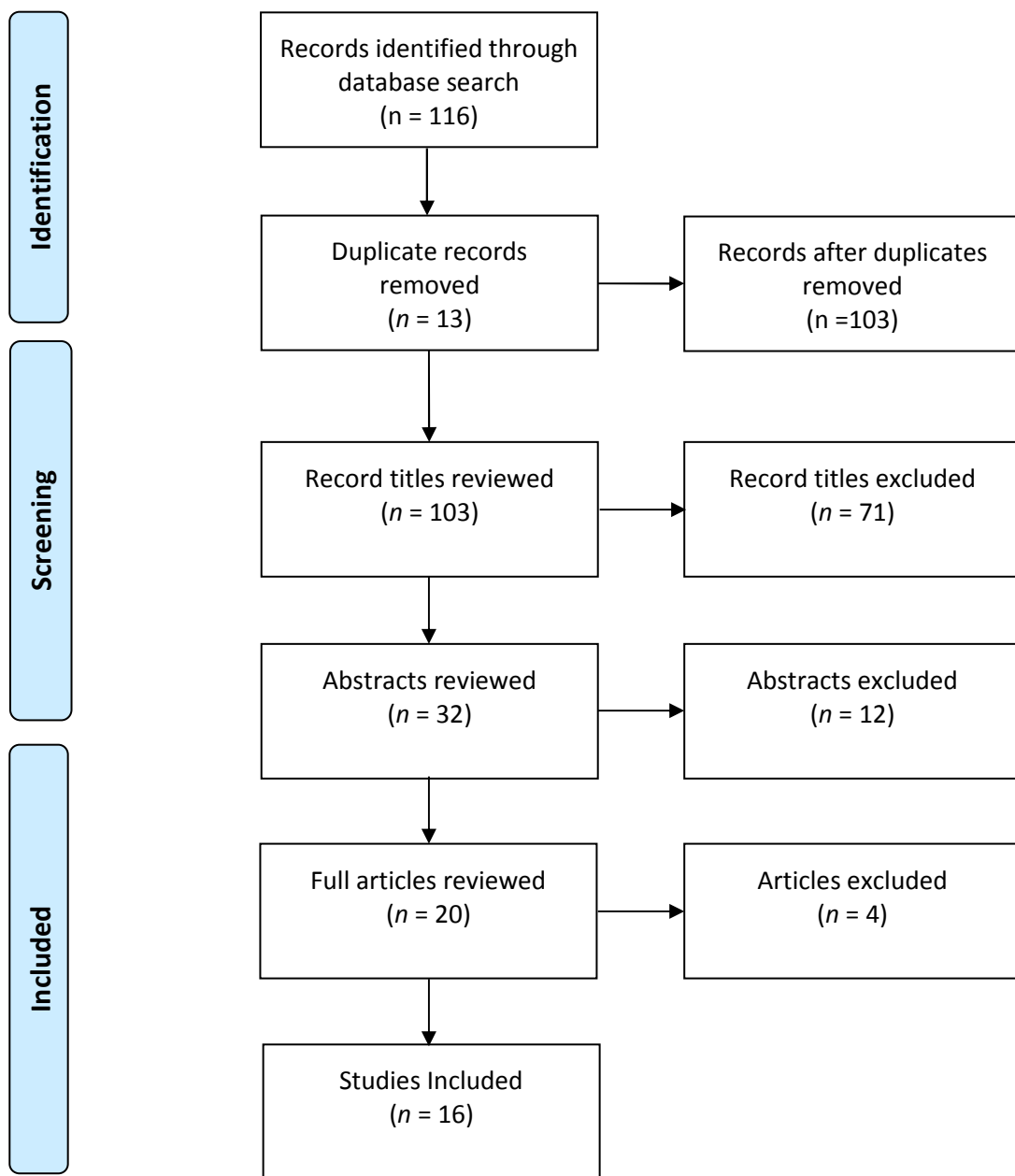
- Is it associated with positive experiences?
- Is it not associated with negative experiences?

**E – Effectiveness; specifically:**

- Was there a beneficial effect?
- Is it safe? (i.e. is there a lack of harm associated with the practice?)

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## Appendix C: PRISMA



## Appendix D: Literature Review Matrix

Study Author/Year	Study Objective	Research Theory/ Methodology	Intervention/ Outcome Measures	Analysis/ Results	Grading
<b>1. Brinzo, J. A., Crenshaw, J. T., Thomas, L., &amp; Sapp, A. (2016).</b>	Study was completed to determine the effect yoga has on the perception of pain	Systematic review of experimental and epidemiological study designs including randomized controlled trials, non-randomized controlled trials, quasi-experimental studies, before and after studies, prospective and retrospective cohort studies, case control studies and analytical cross-sectional studies for inclusion.	Males and females 18 years or older diagnosed with chronic low back pain symptoms that have persisted for at least 12 weeks and have participated in yoga as an intervention weekly for four weeks.	Multiple studies have shown that yoga can be an effective intervention in the management of chronic low back pain. improve back function, increase patient confidence in performing daily activities, flexibility Improvements in depression and anxiety, improves sleep, and sense of well-being	A
<b>2. Chapman, C., Lipschitz, D., Angst, M., Chou, R., Denisco, R., Donaldson, G., &amp; Schoelles, K. (2010).</b>	An interdisciplinary panel of <b>research</b> and clinical experts charged with reviewing the use of opioids for <b>chronic noncancer pain</b> (CNCP) and formulating guidelines for future <b>research</b>	Secondary analysis of Clinical Trials to identify the efficacy of opioid use for chronic non- cancer pain	Veterans prescribed long-term opioids at least six months or longer	Prescribing opioids for CNCP has outpaced the growth of scientific evidence of the benefits and harms. The need for a strong evidence base is urgent. This guideline offers a strategic approach to creating a comprehensive evidence base to guide safe and effective management of CNCP.	A
<b>3. Cosio, D. (2016).</b>	Comparing ACT and CBT to treat chronic, non-cancer pain	Quasi-experimental, single-site, pre-/post-test design	96 Veterans self-selected to participate in either a manualized ACT or CBT for chronic pain group. All participants completed a standard pre- and post-intervention assessment battery.	Both groups decreased illness-focused coping strategies, catastrophizing behaviors, and global distress levels over time	B

(table continues)

Study Author/Year	Study Objective	Research Theory/ Methodology	Intervention/ Outcome Measures	Analysis/ Results	Grading
<b>4. Cosio, D., &amp; Lin, D. E. (2015).</b>	Evaluate the hypothesis that Veterans would report an increase in CAM utilization after completing a formal pain education	quasi-experimental, one-group, pre/post-test design.	103 Veterans12-week, educational program that was comprehensive introduced patients to 23 different disciplines at the VA Medical Center that deal with chronic, non-cancer pain.	A significant difference found in overall utilization of CAM after completing the pain education program	B
<b>5. Cosio, D., &amp; Schafer, T. (2015).</b>	Replicate and extend previous findings; further demonstrating the effectiveness of an ACT outpatient, group-based treatment for Veterans who suffer from mixed idiopathic, chronic, non-cancer pain	pre- and post-intervention measures. Paired-samples t tests were conducted to evaluate the impact of the manualized intervention on Veterans' scores	50 Veterans who participated in an ACT for chronic pain group intervention was evaluated after completing a pain health education program	ACT is a effective treatment for Veterans w/chronic pain as a secondary consultative service.	A
<b>6. Denneson, L. M., Corson K., &amp; Dobscha, S. K. (2011).</b>	Identify and evaluate specific CAM modality use and interest among a large sample of veterans who have chronic non-cancer pain.	Secondary analysis of systematic reviews	Veterans with prior CAM use and veterans with no CAM use when offered CAM therapies the number of veterans interested increased because of positive effects of CAM use (N = 401).	CAM options reviewed demonstrated effectiveness for chronic pain [27–30], patient outcomes might be expected to improve as a result of their use supporting the cost-effectiveness of CAM modalities	A
<b>7. Frank J. W., Carey, E. P., Fagan K. M., Aron, D. C., Todd-Stenberg, J., Moore, B. A., . . . Kirsh, S. R. (2015).</b>	Evaluate the pilot SCAN-ECHO pain management (PM) program (SCAN-ECHO-PM) comparing the types of delivery of care	Multivariable Cox proportional hazards model/association between provider SCAN-ECHO-PM consultation and 1) delivery of outpatient care (physical medicine, mental health, substance use disorder, and pain medicine) and 2) medication initiation	Primary care providers (N = 159) presented one or more SCAN-ECHO-PM sessions had patient panels of 22,454 patients with chronic non-cancer pain (CNCP)	SCAN-ECHO-PM was associated with increased utilization of physical medicine services and initiation of non-opioid medications among patients with CNCP	A

(table continues)

Study Author/Year	Study Objective	Research Theory/ Methodology	Intervention/ Outcome Measures	Analysis/ Results	Grading
<b>8. Matthias, M. S, McGuire, A. B., Kukla, M., Daggy, J., Myers, L. J., &amp; Bair M.J. (2015).</b>	Evaluate the effectiveness of peer support intervention for patients with non-cancer chronic pain	Secondary review of RCTs consisting of five randomized-controlled trials A pre-post study of 20 patients assisted by 10 coaches	Peer support varied in the selected randomized-controlled trials including educational support groups with a non-professional (peer) leader, an internet-based rehabilitation course with peer support elements and regular peer-generated telephone calls.	Peers can effectively deliver pain self-management strategies to other veterans with pain. Self-efficacy and pain centrality showed significant improvements. Improvements in patients' pain scales were also observed, however, the change was not statistically significantly.	A
<b>9. Morasco, B. J., Cavanagh, R., Gritzner, S., &amp; Dobscha, S. K. (2013).</b>	Compare high dose opioids with traditional dose of opioids	A retrospective cohort study of veterans over 2 years	Patients with CNCP who were prescribed high-dose opioid therapy ( $\geq 180$ mg morphine equivalent per day for 90+ consecutive days; n = 60) were compared with patients prescribed traditional dose opioid therapy (5-179mg morphine equivalent per day for 90+ consecutive days; n = 60).	Variables that were assessed did not differ between groups	B
<b>10. Morasco, B. J., Duckart, J. P., &amp; Dobscha, S. K. (2011).</b>	Examine adherence to clinical guidelines for opioid therapy over 12 months, comparing patients with SUD during the prior year to patients without SUD.	Cohort study	Veterans prescribed chronic opioid therapy in 2008 (n = 5814). Only 35% of patients with SUD received substance abuse treatment.	Patients with comorbid substance use disorder(SUD) may need more intensive treatment to achieve improvements in pain-related function, SUD patients may be at high risk for poor outcomes.	B

(table continues)



Study Author/Year	Study Objective	Research Theory/ Methodology	Intervention/ Outcome Measures	Analysis/ Results	Grading
<b>11. Naliboff, B. D., Wu, S. M., Schieffer, B., Bolus, R., Pham, Q., Baria, A., &amp; Shekelle, P. (2011).</b>	Compares effectiveness of a conservative, hold the line (Stable Dose) prescribing strategy for opioid medications with a more liberal dose escalation (Escalating Dose) approach.	RCT	135 patients referred to a specialty pain clinic at a Veterans Affairs Hospital for 12 months (94% male and 74% with musculoskeletal pain). Primary outcomes included monthly or quarterly evaluations of pain severity, pain relief from medications, pain-related functional disability	A significant risk of opioid misuse. no statistically significant differences in primary outcomes between groups, the escalating dose strategy lead to small improvements in acute relief from medications without increase in opioid misuse, compared to the stable dose strategy	A
<b>12. Sekhon, R., Aminjavahery, N., Davis, C. N., Roswarski, M. J., &amp; Robinette C. (2013).</b>	Measure prescribing compliance with the Veterans Affairs/Department of Defense treatment guidelines for chronic non-cancer pain (CNCP)	Retrospective chart review.	All patients with CNCP between the ages of 18 and 87 years who received opioid prescriptions for 3 or more consecutive months(N=800)	Aberrant drug related behavior (ADRBs) were identified in 22.9% of the patients	B
<b>13. Simmonds, M. J., Finley, E. P., Vale, S., Pugh, M. J. &amp; Turner, B. J. (2015).</b>	Examine barriers and facilitators to multimodality chronic pain care among veterans on high-dose opioid analgesics for chronic non-cancer pain.	Three semi-structured focus groups	Twenty-five veterans taking at least 50 mg ME daily oral opioid doses for more than 6 months. , each with seven to nine veterans. Interview guide addressed: chronic pain effects on quality of life, attitudes/experiences with multimodality pain care, social support, and interest in peer support.	Veterans with chronic pain on long-term opioids hold pervasive attitudes that prevent them from using multimodality pain management options	B

(table continues)

Study Author/Year	Study Objective	Research Theory/ Methodology	Intervention/ Outcome Measures	Analysis/ Results	Grading
<b>14. Singh, J. A., Noorbaloochi, S., MacDonald, R., &amp; Maxwell, L. J. (2015).</b>	Comparing chondroitin with placebo, an active control such as NSAIDs, or other "herbal" supplements such as glucosamine.	Systematic reviews of randomized clinical trials or quasi-randomized clinical trials lasting longer than two weeks	Forty-three randomized controlled trials including 4,962 participants treated with chondroitin and 4,148 participants given placebo or another control were included. The majority of trials were in knee OA, with few in hip and hand OA. Trial duration varied from 1 month to 3	Chondroitin use benefit was small to moderate with an 8 point greater improvement in pain (range 0 to 100) and a 2-point greater improvement in Lequesne's index (range 0 to 24), both likely clinically meaningful.	A
<b>15. Singh, J. A., &amp; Fitzgerald, P. M. (2010).</b>	Compares the efficacy and safety of botulinum toxin in comparison to placebo or other treatment options for shoulder pain.	Systematic reviews of randomized controlled trials (RCTs)	Six RCTs with 164 patients were included. Five RCTs in participants with post-stroke shoulder pain indicated that compared with placebo, a single intramuscular injection of botulinum toxin A significantly reduced pain at three to six months post-injection	Botulinum toxin reduced pain severity (MD -2.0, 95% CI -3.7 to -0.3; 10-point scale) and shoulder disability with a reduction in Shoulder Pain	A
<b>16. Whitten, S. K., &amp; Stanik-Hutt, J. (2013).</b>	To enhance outcomes of patients with chronic noncancer pain (CNCP) treated with opioids in a primary care setting by implementing an evidence-based quality improvement project.	Qualitative perceptions of the program and Paired t-test statistics were used to analyze the data.	Implementation of a 6-week cognitive behavioral therapy (CBT) program. Twenty-two patients with CNCP completed the program.	CBT program improved selected outcomes in this self-selected sample of patients with CNCP treated with opioids.	A

## Appendix E: Permission to use JBIM-SR Images



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